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USSR
ELECTRONIC AND PRECISION EQUIPMENT

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I. PROBLEMS OF AUTOMATION

The necessary initial ingredients for the automation of highly complex processes now exist. However, it would be a mistake to assume that there are no more grave difficulties on the road to automation. A number of very serious impediments must be overcome to achieve over-all automation. The main obstacles of purely technical character are as follows:

A shortage of measuring equipment

An automatic unit deprived of measuring instruments is "deaf and blind," and cannot react to changes in the production process. In many cases, its operation cannot be controlled. The amount of measuring equipment available nowadays is absolutely insufficient.

A low level of mechanization, absence in many cases of performing mechanisms, and the performance of manual operations in some cases

Unsuitability of installations or industrial processes for automation

A number of processes in present-day production would be very difficult to automate. Sometimes a process has to be changed radically in order to adapt it for automation. In addition, installations today are sometimes calculated for the limited capabilities of a human operator using manual control. Therefore, their automation cannot bring about any significant rise in equipment productivity.

Insufficient reliability of present-day computing devices under production conditions

Present-day electronic equipment in many cases operates reliably enough, but in many other cases its operation leaves much to be desired. Most successes achieved in the development of more reliable computing equipment based on semiconductors make it possible to hope that in the near future, the reliability of computing equipment will no longer be a prime obstacle to automation.

Insufficient development of the theory of automatic control

Despite the great successes achieved in recent years, in many cases existing theory cannot show how to construct the algorithms of optimum control and how to carry out a synthesis of a relatively simple and sufficiently precisely operating system of control according to a specified algorithm.

Today, theory is often a bottleneck in the development of automation. More attention must be paid to theory. -- Prof A. A. Fel'dbaum, Doctor of Technical Sciences (Avtomatizatsiya Proizvodstva (Automation of Production), Moscow, 1959, pp 31-32)

The system of planning all measures for the development and introduction of new technology must be improved significantly if the problems of automation and mechanization are to be solved. This includes planning for the implementation of mechanization and automation in all branches of the national economy and development of general industrial-type mechanization and automation equipment.

Till now, the introduction of new technology, and mechanization and automation equipment especially, was hardly reflected in the state plan for the development of the national economy; therefore, there was no provision for sufficient materials to back it up. In other words, until now, there was no 7-year plan for the introduction of mechanization and automation, and annual plans on this matter were developed only on a republic level. A number of the most important types of mechanization and automation equipment were not included in the products-list plans for the development of the national economy.

The remedying of these deficiencies will have a profound influence on the introduction of mechanization and automation, and will facilitate a higher growth in the output of instruments and automation equipment.

These and other deficiencies impeding the growth of technology in the USSR were discussed at the June Plenum of the Central Committee CPSU. The resolution of the plenum shows that many sovnarkhozes, enterprises, and scientific research organizations are not fulfilling their assignments for the development and implementation of advanced technology, for the production of new types of products, and for the modernization of obsolete equipment.

Some economists, engineers, and technicians are hampered by conservatism and are unwilling to overcome the difficulties connected with the introduction of new technology. Many leaders lack "state-mindedness" in their approach to the solution of problems concerning the technical improvement of production. The principle of material self-interest of the workers is applied much too infrequently in the development of new technology and its rapid introduction in production. Workers of enterprises implementing new technology sometimes receive much lower wages than those of enterprises producing obsolete equipment.

At present, Gosplan USSR has developed detailed measures for straightening out the planning of the most important work in the development and implementation of new technology and for backing up this work with the necessary material resources. Along with the plan for these important measures, it is also necessary to spur on the initiative of sovnarkhozes, enterprises, design bureaus, and scientific research organizations.

Tasks concerning the future reconstruction and re-equipping of existing enterprises, over-all mechanization and automation of production, and further development of specialization and cooperation in the national economy, which were set up by the June Plenum of the Central Committee CPSU, require that many questions of a purely organizational character be cleared up. An intense day-by-day struggle must be carried on for fulfilling all resolutions of the Central Committee CPSU and the Council of Ministers USSR to make sure that all measures for promoting and accelerating technical progress are put into effect on schedule in all branches of the national economy.

The construction of many instrument plants is taking place at an inordinately slow rate. In some republics, sovnarkhozes that did not meet their original deadlines for putting new plants into operation have been granted extensions. For example, the deadline for putting an instrument-making plant into operation in the Kazakh SSR has been extended for an additional 7 years for no good reason whatsoever. Such a decision fails completely to meet the task of concentrating capital funds and is extremely detrimental to work on automation.

Other sovnarkhozes are fully successful in getting their construction work done and in putting new types of instruments and regulators into production.

The sovnarkhozes that fail to maintain the needed rates of construction of instrument plants do not lack the material means possessed by the others, such as the Kaluzhskiy, Kirgiz, and Orlovskiy sovnarkhozes. All they lack is an understanding of the importance of instrument making in technical progress. In some lagging sovnarkhozes, state discipline is disrupted by some of the leading officials. Such a situation cannot continue because it interferes with automation. In certain cases, even small tasks connected with the introduction of automation are delayed considerably because of a shortage of instruments and regulators. For example, automation equipment has been in the process of installation at the Drokivskiy Sugar Mill for about 3 years. This in turn delays the reception of experimental data for developing standard automation systems for the sugar industry.

The initiative of the Leningradskiy Sovnarkhoz, which pledged before the Plenum of the Central Committee CPSU to produce an additional one billion rubles' worth of instruments for aiding automation, should be encouraged. This initiative is proof of the enormous potential for an increased production of instruments and regulation equipment in other sovnarkhozes.

Parts standardization leads to increased labor productivity. Many branches of industry, including certain scientific research institutes and design bureaus, still develop their own individual instruments and automation equipment and plan their own automation systems. It is time to standardize automation systems as much as possible for individual branches of industry, and to eliminate parallelism in the development of new designs.

The decisive role in this matter should be played by main scientific research institutes, which are far from exhausting their capacities. Most of the institutes not only fail to show initiative in coordinating their projects and standardizing their products, but also try to avoid this work, considering it not obligatory for them.

Certain institute workers think that standardization problems are to be solved somewhere else, by other people. As a result, more than ten institutes and design bureaus are developing pH meters simultaneously.

Scientific research institutes concerned with instrument making should improve their work. This is particularly applicable to NIITeplopribor (All-Union Scientific Research Institute of Thermal Power Engineering Instrument Making), which finished developing a pneumatic standard-unit system about 3 years ago and thereby created a regulation system that unconditionally met present-day technical requirements. However, NIITeplopribor has failed to finish developing the required number of transmitters to operate with the standard-unit regulators. This not only lowers the technical value of the entire system of pneumatic regulators, but also devaluates considerably all work done previously. The institute is slow in developing the new equipment because it lacks the capability to finish the work; however, the institute's leadership fails to manifest initiative in having plant design bureaus and newly organized institutes of sovnarkhozes help it to finish its projects.

The separatist activities of individual institutes do not provide needed results. The serious deficiencies in coordination and planning of scientific research work are detrimental to the cause of automation.

Scientific research institutes do not make sufficient use of the capacities of higher schools. The special chairs and laboratories of many educational institutes are staffed with highly skilled scientists. Efforts should be made to utilize the work done by these institutes in solving problems concerning the over-all progress and development of instrument making.

In developing new automation equipment and instruments, not only USSR achievements, but also the highest achievements of other socialist countries should be taken into account. The existence of the Council of Mutual Economic Aid proffers ample opportunities for this, but unfortunately, these opportunities have scarcely been used by our designers.

One of the leading instrument-making design bureaus [GSOKB -- State All-Union Special Design Bureau, PO Box 472, Leningrad], which has many experienced workers, is doing much valuable developmental work and enjoys well-deserved recognition. However, A. A. Andreyev, the director of this design bureau, has one glaring fault: overconfidence in himself. He thinks that all the designs made under his leadership are the best, but this is far from true. The design bureau of the Karl Marx Plant [VEB "Karl Marx" Messgeraete und Armaturenwerk, Magdeburg] in the GDR, which operated for a while using blueprints received from the design bureau headed by Andreyev, was forced to develop and produce its own universal electronic recording instrument; this instrument was vastly superior to the EPP-09 developed by Andreyev. The main advantages of the German-made recording instrument are its simplicity, reliability, universality, and low weight. It weighs only half as much as the EPP-09.

Two conclusions may be drawn from the above: First, a designer should not divorce himself from the consumer. He should pay greater attention to the opinions of plant design bureaus and plant technologists. Second, a leading designer should be responsible for the technical level of products and should not consider himself above responsibility for the utilization of poor semifinished products, individual units, and parts received under interplant cooperation.

The Karl Marx Plant did us a favor in showing that it was able to utilize a new reversible motor, which made it possible to greatly simplify the entire kinematic system of the measuring instrument. This small example graphically illustrates how important it is to continuously study the activities of ancillary organizations and how harmful excessive self-confidence and complacency can be.

Along with the expansion of scientific research and experimental design organization, and with the creation of experimental facilities for them, it is necessary to provide for a single technical policy and to intensify the coordination of work in developing automation equipment and instruments.

Plant laboratories, special design bureaus, branch scientific research institutes, scientists from higher educational institutes, and institutes of the Academy of Sciences should work together harmoniously toward this end.

The great opportunities afforded by electronic technology in automating production processes necessitates the development of a special plan for implementing electronic technology in all branches of the national economy. The Plenum of the Central Committee CPSU assigned the compilation of such a plan to Gosplan USSR, the State Committee for Automation and Machine Building of the Council of Ministers USSR, and the State Committee for Radioelectronics of the Council of Ministers USSR.

The GNTK (State Scientific and Technical Committee of the Council of Ministers USSR) and the State Committee for Automation and Machine Building of the Council of Ministers USSR, utilizing the tentative plans of union republics, sovnarkhozes, ministries, and departments as a basis, are working out assignments for the most important work in the development of new technology. Engineers and technicians as a whole should join in this work and consider it their duty to help the GNTK as much as possible.

At present, the GNTK is preparing materials on standardizing output signals of transmitters for automatic control and regulation systems. This work is one of the elements of a single technical policy in the development of new instruments and automation equipment. (Moscow, Priborostroyeniye, Aug 59, pp 1-3)

II. LOCAL PRODUCTION AND ORGANIZATION

A. Moscow City Sovnarkhoz

The Moscow Energopribor Plant overfulfilled its plan for the first half of 1959 and has finished its August 1959 plan ahead of schedule. Recently, it began the production of the MARS-200 control computer, which simultaneously controls temperature, flow, vacuum, and other indexes of a production process at 200 points.

The Energopribor Plant has been in existence for more than 15 years, it has specialized in the production of complex instruments and apparatus, mainly for the automation and mechanization of electric power stations and systems. The plant has produced automatic repeater switches for 400- and 500-kw transmission lines, differential high-frequency protective equipment, microsecond meters, complex tools for finding breakdowns in cable networks, and other equipment. Almost all its products are based on electronics.

However, the Moscow City Sovnarkhoz has been saddling the plant with the manufacture of simple products, such as vending machine coin boxes, strain gauges, and strain gauge diaphragms, which are extraneous to the plant's production structure.

Recently, plant designers, in collaboration with the All-Union Heat Engineering Institute, developed a contactless system for regulating the machinery of thermal electric power stations. The new equipment was put through industrial testing, and power engineers requested that it be series produced as soon as possible. However, planning organs, with the consent of the Moscow City Sovnarkhoz intend to have this equipment produced at a performing mechanisms plant under construction in Cheboksary even though it could be produced more readily by the Energopribor Plant, which developed the equipment and could continue with the parallel development of modifications of contactless regulators for chemical water purification and other power station services. The Energopribor Plant could also revise old regulators now installed at power stations. However, it is being prevented from fulfilling this great and important work.

The Energopribor Plant makes gauges for measuring moisture content in insulation. Two years ago, the All-Union Scientific Research Institute of Electric Power developed a new, more effective electronic insulation moisture content gauge, the YeV. The Energopribor Plant is obviously better suited for producing this gauge, however, the Moscow City Sovnarkhoz stubbornly refuses to include its production in the plant's plan.

The Energopribor Plant should produce only electronic equipment for power systems and should not be forced to produce simple types of products not conforming to its production structure. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 30 Aug 59)

B. Moscow Oblast Sovnarkhoz

I. Almazov is chief of the Independent Design And Technolgical Bureau for Planning Glass Instruments and Apparatus (Samostoyetel'noye konstruktorsko-tekhnologicheskoye byuro po proyektirovaniyu priborov i apparatov iz stekla), which is helping the Klin Thermometer Plant and the Moscow Oblast Sovnarkhoz put improved thermometers into production.

The Klin Thermometer Plant produces hundreds of types of mercury thermometers and mercury switches for various industrial and agricultural purposes.

A group of specialists of the instrument division of the bureau has been studying USSR and foreign thermometers, resistance thermometers and thermocontactors, and mercury switches. USSR industry produces industrial and laboratory thermometers with maximum ranges of up to 500 degrees centigrade. Foreign-made thermometers have maximum ranges of up to 800 degrees centigrade.

The bureau's glass division and its thermometer laboratory have developed new thermometers with maximum ranges of 600 degrees centigrade. In 1959-1961, the bureau intends to develop and introduce into production thermometers with maximum ranges of 1,000-1,100 degrees centigrade, and thus it will surpass anthing achieved abroad. The glass division, under the leadership of Romashechkina, is also developing color enamels which will fuse well with glass.

The bureau and the Klin Thermometer Plant are doing their utmost to develop and produce superior thermometers, thermocontactors, and other instruments. (Moscow, Krasnoye Znamya, 30 Aug 59)

C. Moldavian SSR

A year or two ago, there were no electrical engineering plants in the Moldavian SSR; there are now 18, of which 10 are in operation and turning out products.

The Bendery Moldavkabel' Plant ships cable and lighting cord to many regions of the USSR. The Kishinev Mikroprovod Plant has begun the production of hermetically sealed and nonsealed microwire, which is used in computers, radio equipment, and machines, and is sent to scientific research institutes of Kiev, Moscow, and Leningrad. The Kishinev Electrical Measuring Instrument Plant has begun the production of oscillographs, which are used for recording many oscillations and vibrations occurring simultaneously in various parts of machines and units. These instruments are being used on an ever wider scale in various branches of industry, especially machine building.

At the end of 1959, the Kishinev Elektrotochpribor Plant [Kishinevskiy zavod "Elektrotochpribor"] will turn out its first products, radioelectronic instruments. It will produce high-precision magnetic and ultrasonic flaw detectors and will be the main mass producer of these instruments in the USSR. The [Kishinev] Electrical Machinery Plant imeni Kotovskiy, the Bel'tsy Electric Fixtures Plant (Bel'tskiy zavod elektroosvetitel'noy armatury), and the Orgeyev Electrical Installation Products Plant (Orgeyevskiy zavod elektroustanovochnykh izdeliy are already in operation and turning out products. Preparatory work is being conducted for the establishment of a transformer plant, the Moldavizolity [Moldavian Insulation Materials?] Plant, an electrothermic equipment plant, and others. Plants currently under construction are being supplied with modern equipment; existing plants will undergo continuous technical improvement.

The system of training workers, engineers, and technicians must be revised in the Moldavian SSR to satisfy the requirements of this new branch of industry.

(Source gives details on how the training system is being adapted to suit the requirements of the electrical and instrument making industries.) (Kishinev, Kommunist Moldavii, Sep 59, p 74)

The Tiraspol' Mikrodvigatel' Plant has started assembly of its first consignment of 0.18-kw "Elektromalyshka" miniature electric motors, which will soon go into production.

The Bendery Electric Crane Equipment Plant (Benderskiy zavod elektrokranovogo oborudovaniya), which recently went into operation, has mastered the production of seven types of products in 2 months, including hoisting cranes and current collector resistors. This plant supplies products to 45 enterprises and construction sites in the USSR and fills orders for electric crane equipment for several foreign countries.

The Soroki Elektrobytpribor Plant has expanded the assortment of its products and has started production of electric flatirons with automatic heat control.

Among the products being produced by the fast-growing electrical engineering industry of the Moldavian SSR are precision electric measuring devices, motors, microwire, and household instruments. (Kishinev, Sovetskaya Moldaviya, 5 Sep 59)

D. <u>Estonian SSR</u>

At the Tartu Instrument Making Plant, the workers maintain a high class of operations, precision, and technical competence, but there is insufficient effort devoted to improving the design of instruments.

However, the Administration of Machine Building of the Estonian Sovnarkhoz is to blame, for there are many shortcomings in the organization of material and technical supply to the plant.

Furthermore, as at other plants of the city, intrashop and intershop transport are poorly developed here, and this is all the more ridiculous in that the shops of the Tartu Instrument Building Plant are located at separate points throughout the city.

Ovsyannikov, director of the plant, complains that construction is proceeding very slowly at a time when the plant sorely needs production space and valuable equipment is standing idle. And although the plant has modern equipment in operation, the plant laboratory does not have even the simplest grinding wheel. (Tallin, Sovetskaya Estoniya, 18 Aug 59)

E. <u>Kirgiz SSR</u>

During its 18 months of operation, the Frunze Physical Instrument Plant has put five new modern instruments into series production. In 1960, it will begin the production of 17 new instruments.

The plant has tested and is ready to produce the new small type TsUM-1 universal centrifuge. It is also preparing to produce supercentrifuges with continuous division of liquid mixtures, clinical centrifuges, and laboratory-type refrigerator centrifuges with refrigeration chambers.

The plant is improving its earlier expensive paper electrophoresis apparatus and will soon produce a cheap and simple apparatus.

In 1965, the plant plans to make a two-channel encephalograph, which is used for determining the intensity of anesthesia during complicated operations.

The plant is also developing instruments for industrial purposes, including the miniature type MESU-1 electronic level indicator, which has already been tested and is being prepared for series production. It has developed an experimental model of a two-scale electronic level indicator, which will show the level of substances in two containers simultaneously.

At present, the plant is developing a medium-power voltage stabilizer. (Frunze, Sovetskaya Kirgiziya, 2 Sep 59)

III. ELECTRONIC EQUIPMENT

A. Prices

The Central Trade Base of Posyltorg [All-Union Mail-Order Office] offers the following radios for shipment on mail order:

	Price (Rubles)
Rodina-52M radio, modernized seven-tube model, complete with antenna and set of batteries	670
Rekord radio, five-tube, three-wave-band set powered from 127- or 220-v circuit	339
Ural-57 radio-phonograph, six tubes, four-wave bands, with two loud-speakers	945

The above prices include shipping costs to the Moldavian SSR. -- Advertisement (Kishinev, Sovetskaya Moldaviya, 22 Aug 59)

The Central Trade Base of Posyltorg offers the following radios for shipment on mail order to the Lithuanian SSR.

	Price (Rubles)
Rodina-52M radio	662
Rekord radio	336
Ural-57 radio-phonograph	938

The above prices include shipping costs to the Lithuanian SSR. -- Advertisement (Vil'nyus, Sovetskaya Litva, 23 Aug 59)

The Yenisey television set, which receives five channels, has a screen picture size of 280 x 210 mm and is enclosed in a table-model wooden varnished cabinet. It retails for 1,650 rubles. This price was set by Gosplan USSR on 10 June 1959. (Moscow, Byulleten' Roznichnykh Tsen, No 24, Aug 59, p 15)

The Melodiya (MG-56) tape recorder is designed for double-track recording and reproduction of sound from a microphone, a wired-radio line, a radio receiver, or an electrical phonograph pickup. It has three dynamic loud-speakers. The tape speed is 9.53 and 19.05 cm/sec. The set sells for 2,900 rubles retail, with the accessories and spare parts provided for in the technical specifications. The selling price was approved on 16 June 1959 by Gosplan USSR, and will remain in effect until December 1960.

A spare type DM-2 two-speed reversible 180-volt AC, 50-cycle induction motor for this tape recorder retails for 280 rubles. This motor has an input power of 70 watts and speeds of 960 and 460 rpm. (Moscow, Byulleten' Roznichnykh Tsen, No 24, Aug 59, pp 23-24)

The following retail prices for radio components were approved by Gosplan USSR on 1 June 1959:

	Price (Rubles)
Remote control set for Festival radio receiver	400
Tone control set including two capacitors and two resistors for VEF-Akkord radio-phonograph or radio-receiver	6
6N14P duo-diode tube	17
KSO-11 mica-plastic capacitors	1.50 to 3.20
KBF capacitor units with impregnated paper dielectric	4.30

The following retail prices for Yenisey television set components were approved by Gosplan USSR on 10 June 1959:

	Price (Rubles)
Correction choke	1
Power supply filter choke	14
Power transformer coil	28
Power transformer in set with type PM fuse holder, and voltage switching block	55
Output transformer (audio)	10

(Moscow, Byulleten' Roznichnykh Tsen, No 24, Aug 59, pp 13-16)

The following retail prices for radio receiver spare parts were approved by Gosplan USSR on 25 June 1959:

	Price (Rubles)
Automatic frequency control for Festival' radio receiver, in set with electric motor and group of contacts	148.00
Volume control unit for Festival' radio receiver, including volume-control electric motor and remote control panel	148.00
Radio-frequency unit (medium- and long-wave) with three-key switch for Strela radio receiver	37.00
Intermediate-frequency discriminator (465 kc AM and 8.4 mc FM) for automatic frequency control of Festival' radio receiver	37.00
Circuit block (short-, medium-, and long-wave) for Festival' radio receiver (drum-type unit with electric motor)	220.00
Output transformer for Strela radio receiver	6.50
Antenna filter (unshielded) for Strela radio receiver	4.50
Filter (PCh1 or PCh2 transformer in shield) for intermediate frequency of 465 kc, with two tuned circuits, for Strela radio receiver	10.00
Filter (FM-AMIII transformer) for intermediate frequency of 465 kc (for AM) and 8.4 mc (for FM), for Festival' radio receiver	45.00

(Moscow, Byulleten' Roznichnykh Tsen, No 26, Sep 59, pp 12-13)

B. Bulbs and Tubes

An air-conditioning installation has been put into operation in the television picture tube shop of the Moscow Electric Bulb Plant. This installation maintains a year-round temperature of no more than 22 degrees centigrade at a relative humidity of 40-60 percent. The Moscow Electric Bulb Plant currently has a total of more than 580 ventilation units in operation. (Riga, Sovetskaya Latviya, 17 Sep 59)

The L'vov Electric Bulb Plant has mastered the production of new television picture tubes with diagonals of 43 and 53 cm. The inside of these tubes has been metallized, thus improving the contrast and brightness of the image. (Kiev, Rabochaya Gazeta, 17 Sep 59)

The Riga Electric Bulb Plant is one of the first enterprises in the Latvian SSR to convert to a 7-hour day schedule of operation.

Two fully automated constant-flow lines received from Saratov have been installed in the bulb assembly shop of the plant.

By virtue of improvements in technology and expansion of production space, the plant is expected to nearly double its output of bulbs by the end of the Seven-Year Plan. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 18 Sep 59)

C. Components

In Novosibirskaya Oblast, it had been planned to produce the same kinds of radio components at several radio plants. When the plant was revised, it was established that the specialization of one of these plants would make it possible to automate its production and double its output, and that it would be unnecessary to construct facilities for making these products at the other plants. (Moscow, Promyshlennoye Stroitel'stvo, Oct 59, p 3)

The USSR radio industry has begun the production of type MBGO metal-paper single-layer sealed capacitors, which are superior to the type MBGP. (Kondsatornyye ustroystva v skhemakh releynoy zashchity i avtomatiki (Capacitor Units in Relay Protection and Automatics), Moscow, 1959, p 46)

An assembly section of the subassemblies shop (1) of the Minsk Radio Plant has started organizing the production of a new intermediate frequency filter for television receivers. (Minsk, Sovetskaya Belorussiya, 13 Sep 59)

(1) Photo showing soldering operation available in source, p 2, bottom

D. Radios

The A-12 automobile radio, which is designed for installation on Volga and Moskvich passenger cars, retails for 885 rubles without an antenna. This price was approved by Gosplan USSR on 10 June 1959, and remains in effect until 1 July 1960.

The A-12 receives stations on the long- and medium-wave bands and has fixed tuning to five stations. It is powered by the automobile battery and is provided with the necessary accessories and spare parts in accordance with the technical specifications. (Moscow, Byulleten' Roznichnykh Tsen, No 24, Aug 59, p 19)

The Baku-50 radio-phonograph has five wave bands: long-wave, medium-wave, short-wave I, short-wave II, and ultrashort-wave. It has dual tone controls, four dynamic loud-speakers, keyboard band switches, and a universal record player. It retails for 1,050 rubles in an imitation fine-wood cabinet and 1,100 rubles in a fine-wood cabinet. (Moscow, Byullenten' Roznichnykh Tsen, No 24, Aug 59, p 19)

Engineers of the Riga Radio Plant imeni A. S. Popov have designed the new Dzintars (Yantar') radio receiver, which utilizes printed circuits and has automatic tone control. Special shields for the treble and alto loud-speakers make it possible to direct the sound force laterally toward the listener.

The Dzintars is much better looking than the currently produced Sakta and Festival' radio-phonographs. The plant is getting ready to mass-produce the new radio receiver. (Moscow, Sovetskaya Torgovlya, 25 Aug 59)

A group of designers of the Riga VEF Plant, under the direction of Engr A. Brach, have designed and manufactured a model of a new small portable radio based on semiconductors and having an extension acoustical system. This new radio is smaller than the tube-type portable Turist radio receiver, and weighs 2.5 kg. A record player can be attached. The new radio may be powered by either a Saturn battery or ordinary flashlight batteries. It will operate more than 200 hours on a Saturn battery.

This new radio, which employs a printed circuit, has eight wave bands. (Moscow, Komsomol'skaya Pravda, 5 Sep 59)

E. Television Equipment

The Leningrad Plant imeni Kozitskiy is the developer of the Admiral and Chempion television sets. These sets will soon be mass-produced. The Chempion will appear in stores at the end of 1959 or the beginning of 1960.

The Rubin-104 table-model television set has been developed in the Moscow City Sovnarkhoz. (Moscow, Sovetskaya Torgovlya, 18 Aug 59)

During the 2 years of its existence, the L'vov Television Plant has produced the L'vov and the L'vov-2 television sets. The plant recently sent several new domestically designed television sets to international trade fairs in Czechoslovakia and France.

The improved L'vov-60 and the small Trembita television sets will be put into series production in 1960.

Another original set, the Ukraina television receiver, has been designed with a revolving screen. The new receivers are equipped with automatic regulation of image definition intensity. (Kiev, Rabochaya Gazeta, 13 Sep 59)

Prof S. Rempel', Doctor of Technical Sciences, and Engr V. Zhivitskiy of the Ural Forestry Engineering Institute have designed a television receiver for the Moskvich passenger car. This new set employs the circuitry and picture tube of the Start receiver and is powered by the car battery through a semiconductor converter.

N. Permyakov, senior engineer and leader of the telemechanics group of "Uralenergo" [Ural Electric Power Trust?] has designed a nearly identical television receiver and installed it in his Volga passenger car, in which he has also installed a unique portable tape recorder. (Moscow, Vechernyaya Moskva, 23 Sep 59)

F. Communications Apparatus

Engr L. Kupriyanovich of Moscow has designed the telephone of the future, a small pocket-size instrument based on semiconductors and weighing 500 grams. It has been manufactured under the direction of G. Aref'yev, production training foreman of Moscow Technical School No 1.

A small radio transmitter mounted in the telephone sends signals to an ATR automatic city radio station from any point within or near the city, and signals can also be transmitted from the ATR to the radiotelephone in the subscriber's pocket. (Moscow, Moskovskaya Pravda, 20 Aug 59)

The new Neva phototelegraphic device has been developed by the L'vov Telegraph Equipment Plant in collaboration with Leningrad designers. The Neva is designed for transmitting photographs, tables, drawings, and various text materials over long distances via aerial cable lines or radio relay lines. A set consists of a transmitter and a receiver, and both negative and positive images may be sent over it. The image is received on photographic paper and must be developed. The transmitters and receivers are not large, and weigh a little over 40 kg each.

In 1960, the plant will start production of the Ladoga phototelegraphic device for receiving maps and text materials in black-and-white and halftone images and for single-color reflection of the images on electrolitic paper.

Series production of the Neva and Ladoga will be started during the fourth quarter [of 1959]. (Kishinev, Sovetskaya Moldaviya, 18 Sep 59)

G. Mine Direction Finder

The Krivoy-Rog Scientific Research Mining Institute has completed industrial testing of a unique instrument, a mine direction finder, for checking the accuracy of shaft development. This instrument employs the principle of operation of a radio direction finder. It functions dependably at distances within 100 meters and can be operated by any miner. (Kishinev, Sovetskaya Moldaviya, 18 Sep 59)

IV. COMPUTERS

The BESM high-speed electronic computer was developed by the Institute of Precision Mechanics and Computer Technology of the Academy of Sciences USSR. The M2 electronic computer was developed by the Power Engineering Institute of the Academy of Sciences USSR.

The MN-8 electronic analog computer, which was made in the USSR, is highly universal in scope of application and can be used for simulating the flight of a spaceship. This machine can depict the interaction of two objects and complex processes depending on a number of changing quantities, and can even simulate the process of mountain formation during future centuries.

In the USSR, electronic computer technology has become a powerful means for scientific research. A large number of mathematical problems and logical operations are solved by such universal electronic mathematical machines as the BESM, which are developed under the leadership of academician S. S. Lebedev; the Strela, which was developed under the leadership of Yu. Ya. Bazilevskiy; the M2, Kristall, Pogoda, and MESM electronic machines; the IZ "integrating stars" machine; and many others.

In 1950-1955, the EM-5, EM-7 and EM-8 special electronic computers were developed for solving the problems of efficient utilization of oil fields. The EM-6 electronic analog computer was developed to test the strength of foundations of buildings.

Electronic machines are used for solving the problems of theory of artillery fire, the theory of rigidity and vibration, problems of aerodynamics and ballistics, the passage of elementary particles through substances, and many other problems.

Electronic computers are being developed to select information or to compile a bibliography on a given problem, to process census information, and to plan production and supply on an over-all state level.

In 1954, USSR industry developed the special ATR-1 and ATR-2 special analog computers, the former for calculating traction and the latter for calculating thermal requirements. Both machines were developed to aid in the planning of new railroad lines and new types of locomotives. (M. Ye Zhabotinskiy and I. L. Radunskaya, Radio Nashikh Dney (Radio in Our Times), Moscow, 1959)

Electronic analog computers are used for studying various high-speed processes and give results in the form of graphs showing the relationship between various values. Analog computers are used for studying the movement of aircraft, the vibration of jet engines, and the control of nuclear reactions. If the weight, size, and engine thrust of an airplane are programmed into the machine, it will simulate its flight.

There is no kind of work whatsoever that an electronic computer could not fully or partially automate.

An electronic computer for controlling train movements known as the "automatic engineer" is being tested on one of the suburban branch railroad lines near Moscow. This machine makes calculations based on the nature of the railroad, selects a traction characteristic curve, and "commands" the locomotive, thereby making it travel in a given direction for a set period of time.

Scientists of the Georgian SSR have developed an electronic computer for automating the operations of the blast furnace of the Zhdanov Azovstal' Plant. An electronic machine is used for controlling the operations of several resistance furnaces in a synthetic rubber plant. The machine measures temperature and pressure at 300 points.

A computing center is being developed in Uzbekistan. An Ural electronic computer is in operation at the Institute of Nuclear Physics in Tashkent.

Soviet scientists and engineers are developing automatic units for controlling the operating schedules of up to 750 oil wells. Systems are being developed for the automatic control of petroleum pipelines, gas pipelines, and irrigational networks, as well as for controlling the operations of oil refineries. -- Engr A. Vasil'yev-Chebotarev (Tashkent, Pravda Vostoka, 22 Aug 59)

In 1958, the MARS-300 control computer for automatic recording and signaling at 300 points was produced in the USSR. This machine was developed in the SKTB BFA (Independent Design and Technological Bureau for Biophysical Apparatus). (Ye. G. Dudnikov, Nekotoryye Problemy Avtomatizatsii (Certain Automation Problems), Moscow, 1959, p 15)

One of the machines for automatic recording and singnaling (MARS), developed by the design and technological bureau of the Moscow City Sovnarkhoz, has been in operation for about a year in the Moscow Krasnyy Bogatyr' Plant. This machine aids in maintaining the proper time and temperature of vulcanization in 48 electric presses.

The Moscow Energopribor Plant has organized series production of machines for automatic recording and signaling. (Ashkhabad, Turkmenskaya Iskra, 17 Sep 59)

The ELRU electronic logical recorder unit, which is used for regulating industrial processes, is no larger than a refrigerator. It handles all data and prints them on special blanks. An operator no larger has to keep a log book of a process. If a process is disrupted, the ELRU flashes a red light and emits a shrill audio signal, which shows the operator where the breakdown has occurred. The ELRU itself will re-establish the needed process schedule.

The ELRU was developed in a division of the Scientific Research Institute of Computer Machine Building headed by V. B. Ushakov, Doctor of Technical Sciences. A group headed by P. N. Kopay-Gora, Candidate of Technical Sciences worked on the development of this device. Engineers Ya. I. Grinya and G. A. Storozhkin participated actively in its development.

According to Kopay-Gora, the ELRU can be used in many branches of industry. In the near future, it will be installed in the capron fiber shop of the Klin Synthetic Fiber Combine. At first it will be used for controlling the temperature at 48 different points. It will maintain temperature very stringently and will eventually replace the ordinary thermometers now used in the combine. (Moscow, Trud, 30 Aug 59)

During the Sixth Five-Year Plan, the Leningrad Experimental Computing and Analyzing Machine Plant will produce accounting machines for the divisions of Gosbank and savings banks: ticket-cash registering machines in railroad stations, city transport facilities, and spectator entertainment establishments; and analog computers for the centralized accounting of all financial operations. (Mashinostroyeniye i Priborostroyeniye Leningrada v 1959-1965 (Machine and Instrument Building in Leningrad in 1959-1965), Leningrad, 1958, p 15)

Many young people who have finished intermediate school are working in Machine Shop No 1 of the Vil'nyus Computing Machine Plant. (Vil'nyus, Sovetskaya Litva, 30 Aug 59)

On the eve of the 50th anniversary of the Saratov State University imeni N. G. Chernishevskiy, which will take place on 6 October, a computer center has been established here, in which Ural universal electronic computers have started operating. The workers of this center will be engaged in the further improvement of electronic machines, the development of theories of their operation, and the search for new fields of application for them. (Kishinev, Sovetskaya Moldaviya, 18 Sep 59)

V. INSTRUMENTS

A. Electrical Instruments

In 1958, the instrument making industry of the Kiyevskiy Sovnarkhoz mastered the production of a number of electrical measuring instruments of a high-precision class:

The type BU-3 unit is designed for the magnetic testing of magnetically permeable materials with a coercive force up to .2 oersted, magnetically impermeable materials with a coercive force up to 200 oersteds, and highly coercive materials with a coercive force up to 1,500 oersteds.

The U592 unit is designed for the laboratory measurement of capacity, inductance, and the time constants of resistance on the frequencies of 500, 1,000, and 4,800 cycles per second.

The type M1103 sparkproof ground resistance meter is designed for checking grounding in mines and on the surface, including areas where dangerous gases are present, in temperatures ranging from minus 25 to plus 60 degrees centigrade with relative humidities up to 98 percent.

The type E500 electromagnetic-type phase indicator is designed for determining the phase shift of current (E500/1 instrument) and the phase shift of voltage (E500/2 instrument) in relation to all three-phase voltages of a network.

The R513 type MERP capacitance box consists of a four-decade box with a total capacitance of 1.111 microfarads. Three of the decades are lever-type mechanisms and the fourth is a variable capacitor. The R513 is designed for use in bridge circuits, and for general use in AC circuits with frequencies of 40 to 10,000 cycles per second with a maximum operating voltage of 300 volts.

The type D57 calibration ammeters, voltmeters, and wattmeters utilize electrodynamic systems of operation, are shielded and portable, and have a precision of .1. These instruments are designed for calibrating and checking precision electrical measuring instruments and also for high-precision measurements of amperage, voltage, or wattage.

The type E 59 voltmeters, ammeters, and milliammeters are shielded portable moving-iron instruments with a precision class of .5 and are designed for measuring amperage and voltage in AC and DC circuits.

The type D539 laboratory wattmeters utilizing ferrodynamic operating system are single-phase, portable, shielded instruments with a precision class of .5. They are designed for measuring wattage in 50-cycle AC circuits, and for 90-500-cycle AC circuits and for DC circuits as well.

(Source gives detailed information on these instruments and includes illustrations of all of them.) (Moscow, Priborostroyeniye, Aug 59, pp 30-33)

B. Instruments for Chemicals and Gases

The Experimental Design Bureau of Automatics of the State Committee for Chemistry of the Council of Ministers USSR has designed models of new instruments for the chemical industry. The FKZh-1 instrument, which is currently being tested, employs a photoelement for detecting the slightest change in the density of chemical solutions. It is designed for determining the concentration of a cuprammonium solution during the cleaning of a carbon monoxide admixture from a chemical raw material.

The designers of this bureau have developed several types of instruments for determining the presence of oxygen in potentially explosive mixtures of gases. The DPG-5-52 instrument and the type MGK-3 magnetic gas analyzer both detect even the most insignificant admixture of oxygen. The FKG-1 instrument, which is used for checking the processes of synthesis of ammonia, ethylene, and methanol, performs in 2 minutes the chemical analysis which previously required 2 hours. Experimental models have been turned over for industrial testing. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 4 Sep 59)

The [Khar'kov] Teploavtomat Plant has designed distribution units for receiving pulses from viscous and gradually solidifying substances, and has begun series production of them.

The type UVS-1 unit is designed for receiving pulses from viscous and solidifying substances.

The plant has also developed and begun production of the type UAS-1 distribution unit for receiving pulses concerning pressure from aggressive substances.

(Source gives additional details on both instruments.) (Moscow, Priborostroyeniye, Sep 59, p 30)

Many various modern analytic instruments have been developed in the USSR. The production of gas analyzers has undergone the most pronounced development. A number of automatic and semiautomatic gas analyzers are either being produced or being readied for production. Instruments are produced for determining the composition of various gases in wide ranges of concentrations of the measured substance, utilizing various measuring methods, such as the thermochemical, thermal conductometric, electrical conductometric, optical (including interferometric, photoelectric, and optical-acoustical), magnetic, chromatographic, mass-spectrometric, and others. Instruments have been developed which are based on ultrasonics, selective ultraviolet absorption, radioactivity, and magnetic-nuclear and magnetic-electronic resonance spectrometers.

A large number of laboratory and industrial pH meters have been developed and are being produced.

Concentration meters based on various methods, such as the conductometric, dielectric, optical, and polarographical methods, have been developed and are being produced. (Moscow, Izmeritel'naya Tekhnika, Sep 59, p 1)

The Institute of Geochemistry and Analytic Chemistry of the Academy of Sciences USSR has developed three instruments for determining the concentration of boron in geological samples. One of these is used in the laboratory, the second is for use in the field at great depths, and the third is for use in determining the presence of boron in topsoils.

All of these instruments employ the principle proposed by Academician A. P. Vinogradov, which involves the nuclear reaction of a neutron with a boron nucleus. The boron nucleus has the property of vigorously absorbing neutrons.

The institute has developed the first depth instrument, which consists of a steel sleeve housing a neutron source and a meter. As this device is moved past a concentration of boron, the meter registers the rate of absorption of neutrons.

V. K. Khristianov of the institute has recently returned from testing one of these instruments, the principle advantages of which are the speed of analysis and elimination of the need for subsequent laboratory analysis, thus permitting more immediate control of prospecting operations. (Moscow, Vechernyaya Moskva, 8 Sep 59)

The OKB [Special Design Bureau] for Automatics of the State Committee for Chemistry of the Council of Ministers USSR has developed the type DPM-piezometric densitometer, which was tested in the automation of the process of extracting phosphoric acid from apatite by the sulfuric acid method.

(Source gives additional information on the testing of this instrument.) (Moscow, Priborostroyeniye, Sep 59, p 28)

C. Manometers

The types EPID and EPVI differential transformer instruments for remote measuring systems are produced in large series by the Moscow Manometr Plant and other USSR plants.

The Moscow Manometr Plant also produces the type MED remote manometr with a differential transformer circuit and the RED remote flow-rotameter, both of which have a precision of 2.5. (D. V. Svecharnik, Distantsionnyye Peredachi (Remote Transmissions), Moscow-Leningrad, 1959, pp 43-44)

The Moscow Tizpribor Plant produces the MB-410A ammonia recorder manometer and the MVB-410A manometric vacuum meter. (V. B. Yakobson, Avtomatizatsiya Kholodil'nykh Ustanovok (Automation of Refrigeration Installations), Moscow, 1959 p 217)

The [Khar'kov] Termoavtomat Plant is the producer of the TDDA, TDD-1, and TRDK-53 manometric temperature transmitters. (V. B. Yakobson, Moscow, Avtomatizatsiya Kholodil'nykh Ustanovok (Automation of Refrigeration Installations), Moscow, 1959 p 84)

The Moscow Energopribor Plant produces type ChM-120 and ChM-150 manometers, which utilize steel springs that make them unsuitable for systems for regulating combustion processes. (Moscow, Energetik, Aug 59, p 13)

D. Level Gauges

Designers of the Moscow Fizpribor Plant have developed the IU-2 electronic remote-control level indicator for the remote control of various technological processes in the chemical and food industries. (Riga, Sovetskaya Latviya, 5 Sep 59)

The types UR-4 and UR-6 radioactive level gauges were developed by NIITeplopribor [Scientific Research Institute of Thermal Power Engineering Instrument Making] and are now in series production at the [Moscow] Fizpribor Plant. (D. V. Svecharnik, Distantsionnyye Peredachi (Remote Transmissions), Moscow-Leningrad, 1959, p 61)

In 1957, the Design Bureau for Biophysical Apparatus (Konstruktorskoye byuro biofizicheskoy apparatury) of the Moscow City Sovnarkhoz developed the type IU-1 capacitance level gauge. (D. V. Svecharnik, Distantsionnyye Peredachi (Remote Transmissions), Moscow-Leningrad, 1959, p 50)

E. Furnace Control Instruments

The Tallin Control and Measuring Instruments Plant has manufactured an original installation for the radio measuring and recording of the level of blast furnace charges. Plant testing of this new device has already been completed. It functions on the basis of radioactive isotopes, and is designed to transmit signals to a computer which automatically controls the operation of the blast furnace.

The plans for this new device were developed by the workers of the Dneprodzerzhinsk Metallurgical Plant imeni Dzerzhinskiy, in cooperation with the Central Scientific Research Institute of Ferrous Metallurgy and the Ukrainian Institute of Metals. (Kiev, Rabochaya Gazeta, 3 Sep 59)

The OPPIR-09 optical pyrometer is series-produced in the USSR. The precision and reproducibility of its readings allow a deviation of 1-3.5 percent of the true reading value. This precision is satisfactory for the requirements of many industrial processes.

At present, the design bureau where A. A. Andreyev is chief designer [GSOKB -- State All-Union Special Design Bureau, PO Box 472, Leningrad 44] has developed and produced the new type OPK-57 high-precision optical pyrometer.

The OPK-57 has undergone state testing and industrial testing with favorable results. The Kaluga Instrument Making Plant (Kaluzhskiy priborostroitel'nyy zavod) expects to have it in production in 1959.

(Source gives full details on the OPK-57 optical pyrometer.) (Moscow, Priborostroyeniye, Aug 29, p 29)

F. Remote-Control Equipment

Contemporary technology makes it possible to monitor the operation of machines and mechanisms which are hundreds of kilometers distant. No special communications lines are necessary; the signals can be transmitted over high-voltage electric power lines or over telephone lines without interference in the conversation. Such an apparatus is manufactured at the Leningrad Elektropul't Plant.

The design bureau of the plant has developed new, improved systems which will soon replace existing ones. One of these, the TNCh-2, based on semiconductors, will be considerably more dependable than currently produced systems. It will permit observation of current, voltage, capacity, and frequency, steam pressure, or the level of water at distances of hundreds of kilometers. The plant has produced an experimental consignment of TNCh-2 devices.

The experimental workshop of the plant yesterday completed assembly of the first model of an even more improved system, the UTM-1, which will permit not only the monitoring of 23 projects, but also the remote control of 16 of them. (Leningradskaya Pravda, 19 Aug 59)

The Leningrad Elektropul't Plant is the producer of the VRT-53 and UTB-55 remote-control and remote signaling units. (Moscow, Elektricheskiye Stantsii, Sep 59, p 86)

G. Miscellaneous Instruments and Apparatus

The [Saransk] Elektrovypryamitel' Plant produces the type AKI-50 kenètron apparatus for testing power cable. (Moscow, Energetik, Sep 59, p 26)

A new "flaw-detector car" has appeared on the lines of the Moscow Subway. A special motion-picture camera installed in this car registers a beam of light reflected from the rails as the car moves along at a speed of 50 km/hr. Thus, any crack or other defect in the rails is recorded on the film as the car passes over. (Kiev, Rabochaya Gazeta, 18 Sep 59)

The BIV contactless weight-measuring instrument has been developed at TsNIKhBI (Scientific Research Institute of the Cotton Industry). This electronic instrument has two ionization chambers: one contains an isotope which radiates beta rays, and the other, a receiver of these radiations. During the manufacturing process, the impregnated cloth passes between these chambers and the impregnating substance absorbs a certain amount of the radiation in proportion to the thickness of the cloth, thereby permitting control of the process. The BIV instrument has been successfully tested and is currently in operation in the Factory imeni Nogin in the city of Kuntsevo.

This institute has also recently developed a radioactive level measuring device based on this same principle of radiation absorption. This device is used to maintain the proper level of cloth in the steam chambers used in bleaching. A series of these level measuring devices is being manufactured at the Moscow Tekstil'pribor Plant, and two of them are already in operation at Cloth Printing Factory No 1. (Moscow, Vechernyaya Moskva, 20 Aug 59)

The Moscow Tekstil'mashpribor Plant is engaged in the assembly of electronic instruments. (Moscow, Moskovskaya Pradva, 3 Oct 59)

The Institute of Technical Physics of the Academy of Sciences USSR has developed a unique instrument designed for the study of instantaneous processes involving the appearance of light, such as explosions, electrical discharges, etc. This is the LV-1, or "time magnifier," and it will take pictures at the rate of 33 million frames per second. (Minsk, Sovetskaya Belorussiya, 2 Sep 59)

The Moscow KEMZ Motion-Picture Electrical Machinery Plant (Moskovskiy kinoelektromekhanicheskiy zavod "KEMZ") manufactures and sells to all organizations and private persons the Mikrofot microfilm reading projector, which projects the enlarged microfilm image either onto its own screen or onto any other screen. -- Advertisement (Minsk, Sovetskaya Belorussiya, 2 Sep 59)

The Armavir Armolit Plant recently sent a 10-ton pointer-type truck-weighing scale to the Kokhila Sovkhoz in Estonia. (Tallin, Sovetskaya Estoniya, 8 Sep 59)

The new Kristall-K hearing aid is manufactured by the Moscow Hearing-Aid Equipment Plant. It weighs 150 grams and has a transistorized amplifier. It is powered by a small battery which is good for about 60 hours of operation. Special controls permit regulation of both volume and tone. (Kiev, Rabochaya Gazeta, 18 Sep 59)

A design bureau of the Armenian Sovnarkhoz has developed the MEK electrical performing mechanism, which utilizes a crank-type output unit. This mechanism consists of a drive unit utilizing an electric motor and an electromagnetic brake; a non-self-braking cylindrical reduction unit; and a self-braking differential reduction unit with a maximum moment clutch and a hand drive.

A type MKR-0 contactor and a type M592 panel microammeter are supplied with the MEK.

The Cheboksary Performing Mechanisms Plant of the Chuvash Sovnarkhoz and the Sevan Performing Mechanisms Plant of the Armenian Sovnarkhoz are preparing for the series production of this mechanism.

(Source gives additional information and illustrations of the MEK). (Moscow, Priborostroyeniye, Aug 59, p 28)

VI. ELECTRICAL PRODUCTS

A. Rotating Machinery

The Vil'nyus El'fa Electrical Engineering Plant has mastered the production of the new DAI-1 single-phase induction motors with a capacity of 11 watts and an operating speed of 3,000 rpm. They weigh about 500 grams.

These new motors will be used in medical equipment, ionizers, which a Serpukhov plant has started producing and which are used to saturate air with ionized particles of water. The first 400 of these electric motors were shipped to Serpukhov a few days ago.

The production of 60-watt AD-50 electric motors with an operating speed of 2,800 rpm has been organized on order from the Liyepaya Machine Building Plant. (Vil'nyus, Sovetskaya, Litva, 6 Sep 59)

In 1947, only a small percentage of the industrial-frequency selsyns produced in the USSR were contactless types. In 1958, the overwhelming majority of these selsyns produced in the USSR were contactless types. The main direction of development of selsyn designs has been toward either the over-all improvement of the original designs of contact-type selsyns or the development of contactless selsyns, such as those developed in 1938 by the VEI [All-Union Electrical Engineering Institute].

There are four main kinds of contact-type selsyns: those with magnetic systems akin to those of DC machines; those with magnetic systems similar to those of salient-pole synchronous machines; those with magnetic circuits similar to those of synchronous machines not using salient poles; and those with magnetic systems similar to induction motors with in-phase rotors.

Selsyns of all four designs are produced in the USSR. The first and fourth types are less reliable in operation than the others.

The types SS-192-135 and SS-195-150 industrial-frequency selsyns are produced in the USSR. These machines weigh 62 and 65 kg, respectively, approximately 80 times as much as the SS-404 contact selsyn. It is not surprising that selsyns such as these have not been put into use on a large scale.

(Source gives substantial information on selsyns produced in the USSR, the GDR, and other countries.) (D. V. Svecharnik, Distantsionnyye Peredachi (Remote Transmissions), Moscow-Leningrad, 1959, pp 10, 136, and 160)

The Voronezh Electrical Machinery Plant has organized the mass production of small one kg in weight) combination brush and vacuum cleaners for cleaning clothing. (Kiev, Rabochaya Gazeta, 5 Sep 59)

B. Batteries

The Leningrad Leninskaya Iskra Plant is one of the few lagging enterprises in the city. During the first 7 months of 1959, output per worker was 3 percent lower than in the same period of 1958, and only 98.8 percent of the planned labor productivity has been effected.

Reasons for the lag cannot be traced solely to the mastering of new production. For more than 2 years, the plant has been producing D-0.2 disk-type flashlight storage batteries, yet half of those currently produced are rejects. There is some question as to whether there is very much need or demand for a battery such as the D-0.2, which must be recharged after only an hour of use and requires nearly 24 hours to recharge.

During the past 6 months, the plant has hired 122 new workers, but 169 workers have left the plant during the same period. This large turnover is explained in part by the heavy hauling required of workers in certain sections of the plant where mechanization is not proceeding according to schedule. However, this problem is receiving insufficient attention from F. A. Prokopenko, plant director; M. P. Slobodskiy, chief engineer; and G. P. Avdeyev, chief technologist.

A. F. Sapunov, chief designer of the plant, is primarily responsible for an "ailment" shared by plant designers whereby they do not finish what they start. A. I. Kurochkin, the plant's chief mechanic, is not disquieted by the limited enthusiasm with which the plant workers approach the matter of automation and mechanization.

At least part of the reason for last-minute rush and uneven operation at the Leninskaya Iskra Plant is the sporadic supply. For example, the Orsk Nickel Plant usually delivers nickel sulfate during the final 10 days of the month. The same applies to deliveries of battery casings from the Kursk and Saratov rubber products plants, and attempts to negotiate for earlier small shipments of casings from the Leningrad Industrial Rubber Products Plant have met with no success. The Leningradskiy Sovnarkhoz, however, maintains an attitude of disinterested observer in the matter.

(Source contains more detailed information on the situation at the Leninskaya Iskra Plant.) (Leningradskaya Pravda, 18 Aug 59)

C. Insulators

In 1958, the Armset' Trust [State Fittings and Insulator Trust] organized series production of the type PM-4.5 small porcelain suspension insulator, which will be produced in place of the widely used type P-4.5 insulator. In the next 2-3 years, it is planned to master the production of small porcelain insulators with strength equal to that of the currently used P-8.5 and P-11 insulators.

The Scientific Research Institute for Glass, in collaboration with the All-Union Electrical Engineering Institute and the L'vov Polytechnic Institute, has produced experimental models of small insulators made of hardened glass, which are designed for a one-hour electromechanical test load ranging from 4.5 to 20 tons. (Moscow, Elektricheskiye Stantsii, Apr 59, p 54)

The Slavyansk [Fittings and Insulator] Plant has developed the PM-4.5 insulator, which meets the standards of the P-4.5 insulator, but has a structural height of only 140 mm instead of 170 mm. (Moscow, Elektricheskiye Stantsii, Jul 59, p 74)

The L'vov Glass Plant is getting ready for the constant-flow production of type SP-4.5 glass insulators. (Promyshlennaya Energetika, Sep 59, p 62)

A new high-productivity constant-flow line (2) for the production of commutator micanite insulation material has been developed at the Khot'kovo Elektroizolit Plant. (Yerevan, Kommunist, 17 Sep 59)

(2) Photo available in source, p 1

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